Technical Data
Data Sheet N2347, REV.I

S3D20065A
650V SIC POWER SCHOTTKY RECTIFIERS

TO-220AC(TO-220-2)

Description

This 650V 20A diode is high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S3D20065A is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram

Features

- 175°C TJ operation
- Ultra-low switching loss
- Switching speeds independent of operating temperature
- Low total conduction losses
- High forward surge current capability
- High package isolation voltage
- Terminals finish: 100% Pure Tin
- "-A" is an AEC-Q101 qualified device
- Pb – Free Device
- All SMC parts are traceable to the wafer lot
- Additional electrical and life testing can be performed upon request

Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

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Maximum Ratings:

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{DC}	-	650	V
Average Rectified Forward Current	$I_{F(AV)1}$	Tc=25˚C	48	A
	$I_{F(AV)2}$	Tc=135˚C	21	A
	$I_{F(AV)3}$	Tc=140˚C	20	A
Repetitive Peak Forward Surge Current	I_{FRM1}	10ms, Half Sine pulse, T_C=25˚C	105	A
	I_{FRM2}	10ms, Half Sine pulse, T_C=110˚C	70	A
Peak One Cycle Non-Repetitive Surge Current	I_{FSM1}	10ms, Half Sine pulse, T_C=25˚C	170	A
	I_{FSM2}	10ms, Half Sine pulse, T_C=110˚C	145	A
Non-Repetitive Peak Forward Surge Current	$I_{F,Max1}$	10µs. Pulse, T_C=25˚C	1830	A
	$I_{F,Max2}$	10µs. Pulse, T_C=110˚C	1260	A
Power Dissipation	P_{tot1}	T_C=25˚C	136	W
	P_{tot2}	T_C=110˚C	59	W
Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	bf-in

Electrical Characteristics:

Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop*	V_{F1}	@ 20A, Pulse, T_J = 25˚C	1.45	1.7	V
	V_{F2}	@ 20A, Pulse, T_J = 175˚C	1.65	2.0	V
Reverse Current*	I_{R1}	@V_R = rated V_R, T_J = 25˚C	1.5	50	uA
	I_{R2}	@V_R = rated V_R, T_J = 175˚C	15	200	uA
Junction Capacitance	C_T	V_R=0V, T_J=25˚C, f=1MHz	1550	-	pF
Reverse Recovery Charge	Q_c	I_F = 20A, di/dt=200A/µs VR = 400 V, T_J =25˚C	96.7	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V, T_J =25˚C	23.69	-	µJ

* Pulse width < 300 µs, duty cycle < 2%

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Thermal-Mechanical Specifications:

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T_J	-	-55 to +175	˚C
Storage Temperature	T_{stg}	-	-55 to +175	˚C
Typical Thermal Resistance Junction to Case	$R_{\theta JC}$	DC operation	1.1	˚C/W

Ordering Information

Device	Package	Shipping
S3D20065A	TO-220AC(TO-220-2)	50pcs / tube

Ratings and Characteristics Curves

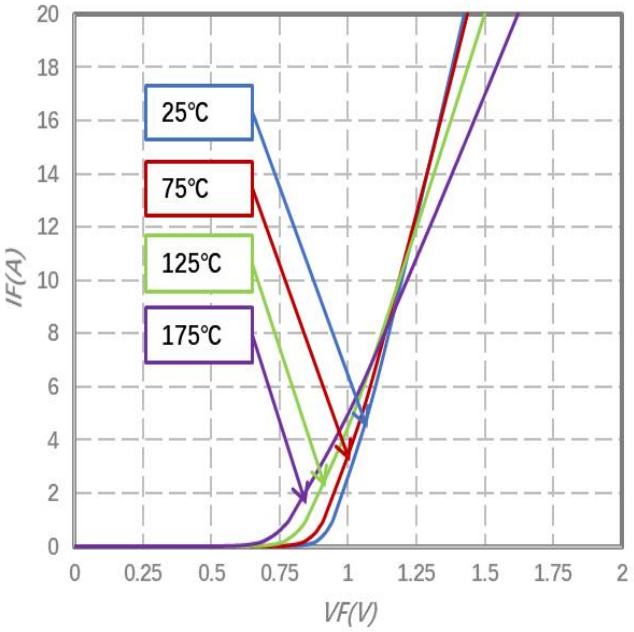

Fig.1-Typical Forward Voltage Characteristics

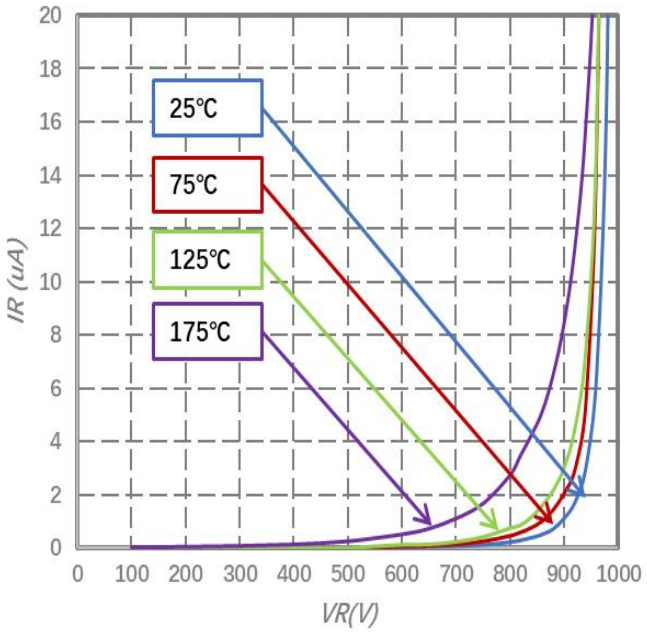

Fig.2-Typical Reverse Characteristics

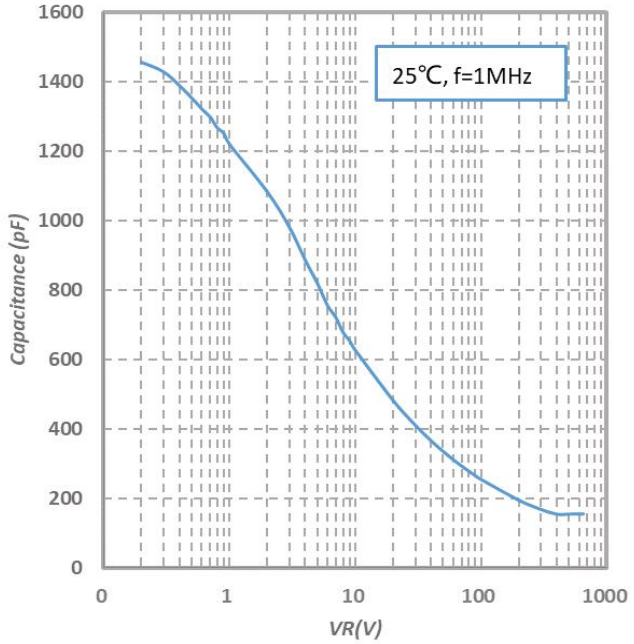

Fig.3-Capacitance vs. Reverse Voltage

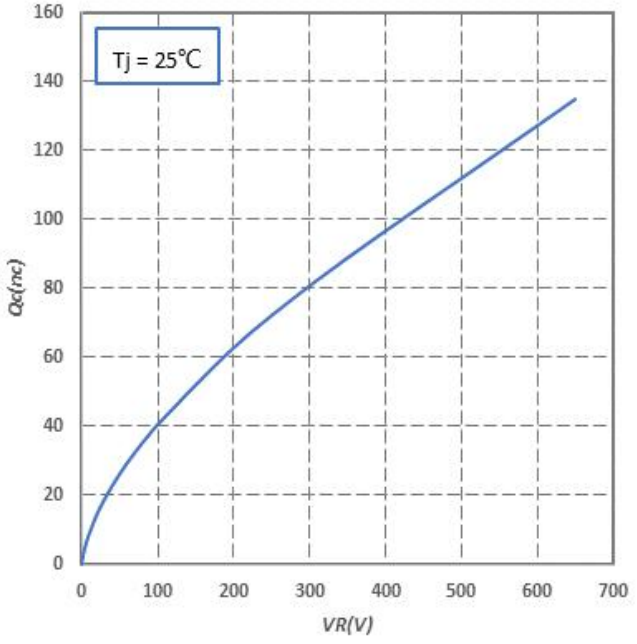

Fig.4-Total Capacitance Charge vs. Reverse Voltage

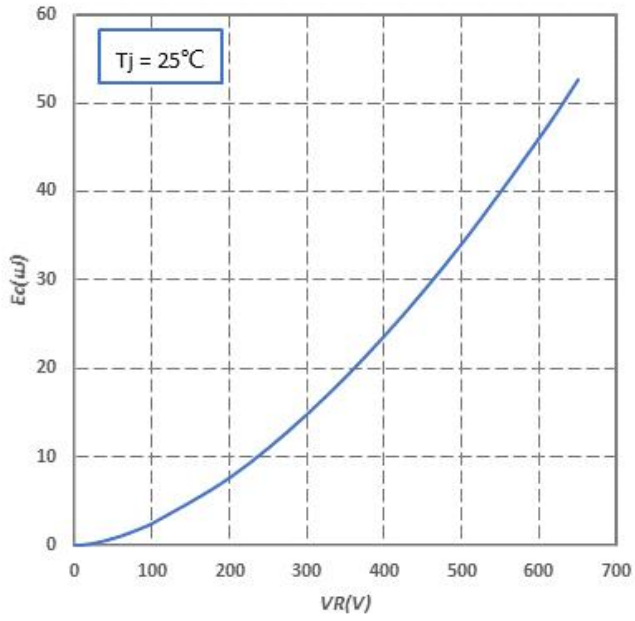

Fig.5-Capacitance Stored Energy

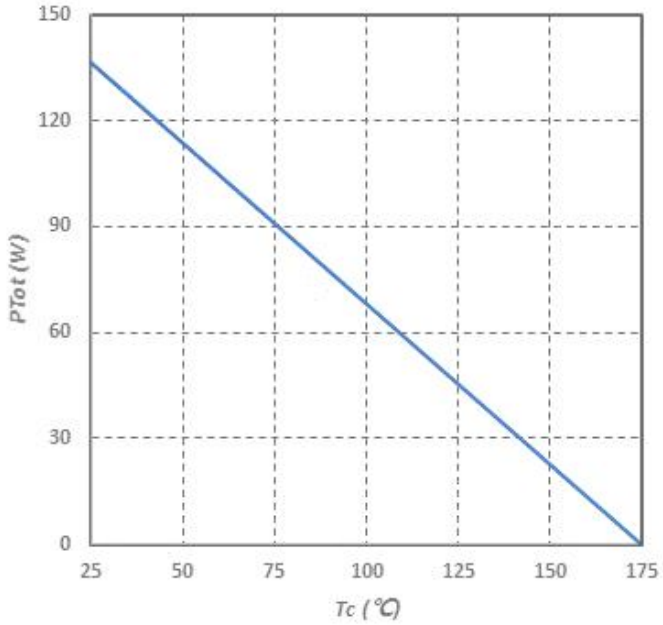

Fig.6-Power Derating

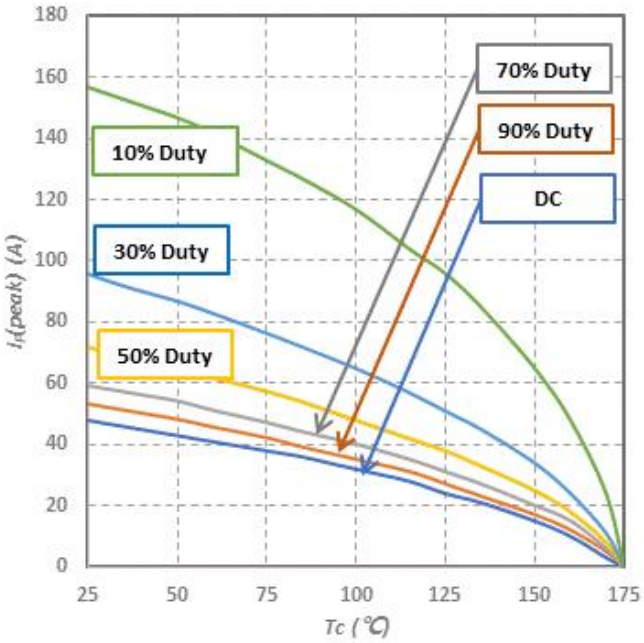

Fig.7-Current Derating

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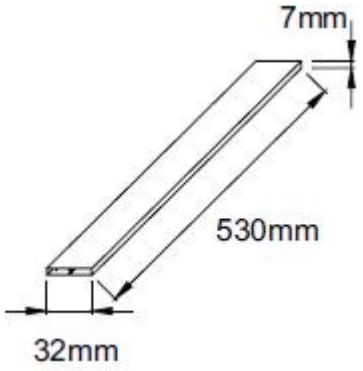
Tube Specification



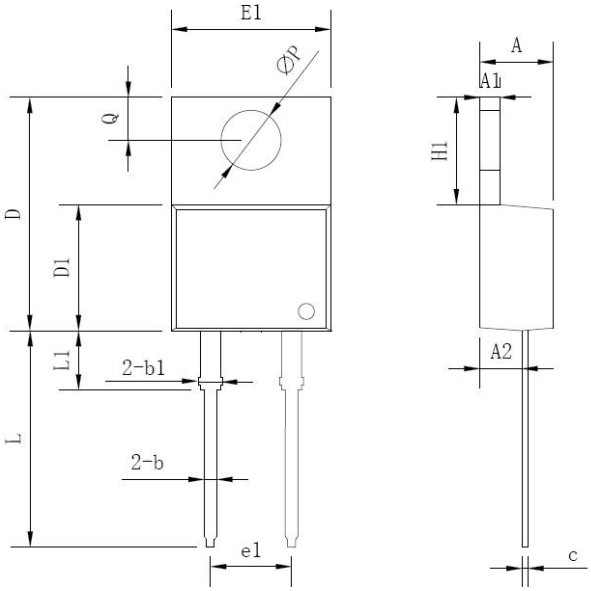
Marking Diagram

Where XXXXX is YYWWL

S3D	= Device Type
A	= Package type
20	= Forward Current (20A)
065	= Reverse Voltage (650V)
SSG	= SSG
YY	= Year
WW	= Week
L	= Lot Number

Cautions: Molding resin
Epoxy resin UL:94V-0

Mechanical Dimensions



Symbol	Dimensions in millimeters		
	Min.	Typical	Max.
A	3.56	-	4.83
A1	0.51	-	1.40
A2	2.03	-	2.92
b	0.38	-	1.02
b1	1.14	-	1.78
c	0.31	-	0.61
D	14.22	-	16.51
D1	8.38	-	9.42
E1	9.65	10.16	10.67
e1	-	5.08	-
H1	5.84	-	6.86
L	12.70	-	14.73
L1	-	-	6.35
ΦP	-	3.56	-
Q	2.54	-	3.43

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